

Studies on Indian Crickets (Orthoptera: Insecta), Part—III¹

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(With eighteen text-figures)

This paper deals with 13 species of Indian Crickets comprising of six genera of the subfamily Gryllinae, of which *Gryllopsis rajasthanensis* Bhowmik, female of *Turanogryllus dehradurensis* Bhowmik, immature stages of *Turanogryllus rufoniger* (Chopard), and male genitalia of *Stephoblemmus humbertiellus* Saussure (which is also a new record from India) and of *Coiblemmus compactus* (Chopard); *Gryllopsis jammuensis* Bhowmik (1967) has been described and transferred to the genus *Turanogryllus*.

INTRODUCTION

This paper is the third in the series on Indian Crickets (Gryllidae) and is a portion of the unpublished material of the thesis submitted for the award of doctorate degree of the Calcutta University. Additional information on the morphology, abundance and nomenclatural changes of 13 species belonging to the subfamily Gryllinae are described. In order to avoid duplication in respect to references etc. only those which have been omitted by Chopard (1969) are included here.

Genus *Gryllopsis* Chopard, 1928

Gryllopsis Chopard, 1928, *Rec. Ind. Mus.* 30:13.

Diagnosis: The genus is characterized by large rounded head and nearly cylindrical body; usually perfectly developed, very wide elytra in males; females may be apterous or may bear very short elytra which sometimes may be reduced to only pads; internal tympanum absent on anterior tibia; subgenital plate with conical or rounded apices; absence of styli-form process in male genitalia.

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Remarks: The genus *Gryllopsis* had been thought so far as one of the very widely distributed genera of oriental crickets. But recent studies based on male genitalia show that this genus and the genus *Turanogryllus* Tarbinskii (1940) though they have in common many morphological characters are readily distinguishable from each other by the presence or absence of styliform process in the male genitalia. It is found that quite a few species described previously as *Gryllopsis* possess styliform process in the genital structures like those of *Turanogryllus*. In the fitness of things those *Gryllopsis* possessing styli in genitalia, *inter alia*, are transferred to the latter genus.

***Gryllopsis furcata* (Saussure)**

1877. *Grylloides furcatus* Saussure, *Me'm. Soc. phys. Hist. nat. Geneve*, 25: 399-400.

Additional characters: FEMALE: Apterous, testaceous brown or rufous brown, pubescent insect with very stout cylindrical body. Head spherically convex, the pale lines on occiput and vertex usually very obscure; in rare exceptions they have four distinct testaceous light lines (specimen from Mysore); arched posterior band about thrice as wide as anterior band, connects the eyes and is brown or dark brown; anterior band also arched and connects only the antennal sockets; frontal rostrum about four times as wide as the first antennal segment; facial shield prominent, convex and with a median suture; clypeofrontal suture almost straight. Pronotum transverse and so convex that it appears saddle shaped, both anterior and posterior margins straight but sides parallel; lateral lobes square shaped, the inferior margin being horizontal. Ovipositor large, strong, shorter than posterior femora, apical valves with acute apices but the superior valves are longer than their corresponding inferior valves. The valves remain wide open at rest. Subgenital plate with truncated apex. Anterior tibia with an oval, elongated tympanum at external face only. Posterior femur very stout and wide, rufous brown, striations on it hardly recognizable but knee is distinctly dark brown; posterior tibia with variable number of spines, usually the inner ridges with four or five spines and the external ridges with five to six spines but specimens from Mysore show four external and five internal spines in both sexes; supero-internal spurs almost subequal to the intermediate internal spurs; posterior metatarsi with four to five internal and four to six external denticles on each margin.

MALE: Differs from female in having well developed brownish or dark brown elytra with three oblique veins extending up to about two-thirds of abdomen; diagonal vein short, straight and biforked at base; mirror much obliquely disposed, wider than long, divided by a curved vein and united with the first chord by a veinlet; apical field very short,

usually with three much obliquely disposed veins and a false vein and with distinct but irregular areolae; triangle intercale distinguishable; anal vein almost broken at right angle, and the scantily reticulated field with five regularly spaced, feebly curved veins; mediastinal vein with one branch only.

Measurements (in mm): Male: Length of body 16.25-17; length of pronotum 4.25-4.55; width of pronotum 5.25-5.5; elytra 6.75-8; posterior femora 11.5-12; posterior tibiae 8-8.75.

Female: Length of body 16.25-20; length of pronotum 4.75-5; width of pronotum 5.25-6.25; posterior femora 14-15.75; posterior tibiae 9.9-10.5; ovipositor 7-14.25.

Material examined: 1 male, 1 female from Mysore city; 1 female from Coimbatore; 2 females from Rajpur (Dehra Dun); 2 males, 2 females from Nagarjunkonda (Andhra Pradesh).

Remarks: This species can easily be distinguished from all other species of the genus by its strongly cylindrical body, besides its rounded head with two transverse bands and open type of ovipositor.

***Gryllopsis rajasthanensis* Bhowmik (Figs. 1 & 2)**

1967. *Gryllopsis rajasthanensis* Bhowmik, *Proc. Ind. Sci. Cong. Assoc. Benaras*, Part B: 491.

Description: FEMALE: Small, body cylindrical, yellowish and densely pubescent. Head as wide as the pronotum in front, yellowish, with two transverse brown bands and of these anterior one connects the bases of antennal sockets and the posterior one the inter-ocular sockets; occiput and vertex with five very indistinct longitudinal brownish lines. Lateral ocelli brownish, anterior ocellus very small and yellowish. Frontal rostrum almost twice as wide as the first antennal segment and parallel sided. Labrum broad, rounded at apex and partially trilobed; clypeus partially divided by a median longitudinal suture; clypeofrontal suture strongly arcuate. Eyes black, very prominent and oval. Pronotum pale yellowish and transverse, anterior margin being slightly concave and posterior margin nearly straight, both margins ciliated, sides a little convex at the middle; disc convex, densely pubescent, with a median longitudinal suture and two triangular lobes brown, rest yellowish, inferior margins ascending posteriorly. Abdomen yellowish but mottled with brownish spots on dorsum. Ovipositor yellow, straight, long, apical valves acute. Legs yellow. Anterior tibia with a long oval tympanum at its external face only. Posterior femora very stout, longer than abdomen, indistinctly striated at external face; posterior tibia with four external and five internal spines; posterior metatarsi with seven external and five internal brownish denticles.

Elytra extending up to the middle of abdomen, yellow, these overlap on

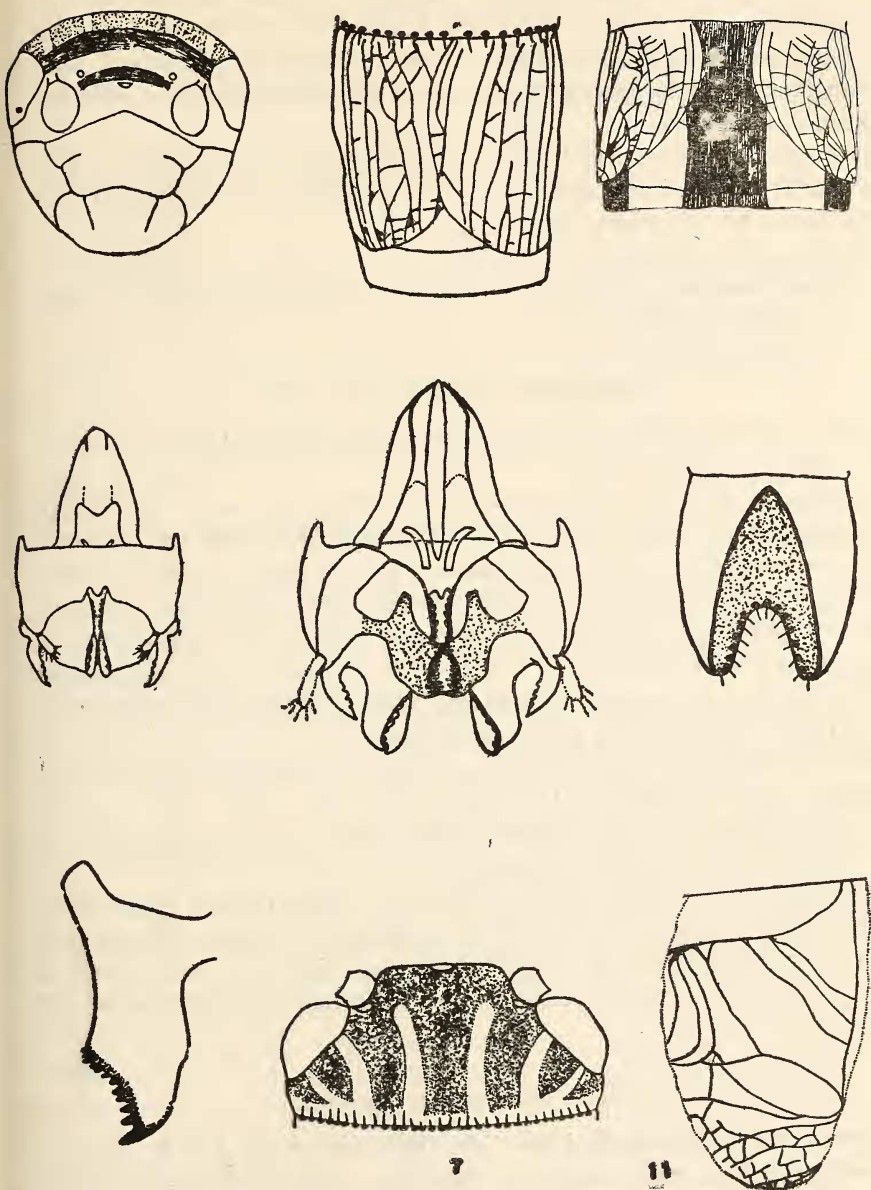


Fig. 1. *Gryllopsis rajasthanensis*, female head, dorsal view. x 17; Fig. 2. *ibid.*, elytra. x 15; Fig. 3. *Turanogryllus rufoniger*, male genitalia, dorsal view. x 18; Fig. 4. *ibid.*, male genitalia, ventral view. x 18; Fig. 5. *ibid.*, apical end of ventral lobe of ectoparamere. x 55; Fig. 6. *ibid.*, subgenital plate of an advanced nymph. x 20; Fig. 7. *Turanogryllus jammuensis*, female head, dorsal view. x 17; Fig. 8. *ibid.*, pronotum and elytra. x 15; Fig. 9. *Turanogryllus histrio*, male elytra. x 15.2.

the median line and are obliquely truncated at apex; dorsal field with five oblique veins besides a sort of a branch from the discoidal; humeral edge brownish and lies in a line with the pronotal band; lateral lobes with four regularly spaced oblique veins; the mediastinal vein with one branch at the apex.

Measurements (in mm): Female: Length of body 9.75; length of pronotum 2; width of pronotum 2.75; elytra 2.6; posterior femora 7; posterior tibiae 4.5; ovipositor 5.7.

Distribution: Rajasthan.

Material examined: 1 female from Gudha (Rajasthan), Coll. T.G. Vazirani, dated 4.11.1958.

***Gryllopsis falconneti* (Saussure)**

1877. *Grylloides falconneti* Saussure, *Me'm. Soc. phys. Hist. nat. Geneve*, 25: 230.

Additional characters: FEMALE: Body moderately stout, cylindrical. Head more wide than long (5-5.25 to 2.95-3 mm), occiput with or without ornamentation, when ornamented it is with four very short, yellow lines. Clypeofrontal suture slightly arcuate. Pronotum transverse, testaceous with blackish patches, anteriorly as wide as the head. Elytra separated by a distance of 1.5 to 2.25 mm. Ovipositor very long, apical valves rufous, acute and closed at rest. Subgenital plate testaceous, navicular and with a shallow apical emargination.

Measurements (in mm): Female: Length of body 13-16; posterior femora 10.5-11; ovipositor 18-18.25.

Material examined: 2 females from Rajaji Sanctuary (Saharanpur dist.); 2 females from Udhampur (Jammu).

Remarks: The species is remarkable for its three distinct longitudinal dark bands on abdomen, stout body, ornamented head, widely separated elytra and closed type of ovipositor. The description of male which is yet unknown is, however, essential to be sure about its position in the genus.

Genus *Turanogryllus* Tarbinskii

Turanogryllus Tarbinskii, 1940, *Salt. Orth. Ins. Azeb. S. S. R.*, 19, 115.

Diagnosis: The most important diagnostic feature of *Turanogryllus* is the presence of styli on the posterolateral extremities of epiphallus. Spherically convex head, quite lateral lobiform female elytra, triangular and strong, longitudinally sulcated male supra anal plate often with two spinules, somewhat bilobed subgenital plate in both sexes and externally visible dorsal lobes of ectoparameres are also remarkable.

Distribution: Russia; Africa; Western Asia; Pakistan and India.

KEY TO INDIAN SPECIES¹

- 1(4) Elytra as long as the abdomen
- 2(3) Body cylindrical; clypeofrontal suture moderately arcuate; head blackish brown with four distinct yellow lines on occiput*quadrilineatus* (Bh.)
- 3(2) Body rather depressed; clypeofrontal suture indistinct, straight; head strongly rounded and without any ornamentation*dehradurensis* (Bh.)
- 4(1) Elytra shorter
- 5(8) Clypeofrontal suture more or less strongly arcuate
- 6(7) Pronotum dark brown with light impressions; two oblique veins; female elytra rudimentary or absent*virgulatus* (Bol.)
- 7(6) Pronotum brown varied with blackish brown spaces; female elytra short, obliquely truncated and separated from each other by a short distance; abdomen with three dark brown bands*jammuensis* (Bh.)
- 8(5) Clypeofrontal suture almost straight or a little arcuate
- 9(10) Pronotum fulvous with a wide posterior brown band; three to four oblique veins; female elytra longer than the metanotum, separated by a very narrow space*rufoniger* (Ch.)
- 10(9) Pronotum without any posterior band; clypeofrontal suture a little arcuate; female elytra short, widely separated*histrion* (Sauss.)

***Turanogryllus dehradurensis* Bhowmik**

1969. *Turanogryllus dehradurensis* Bh., *Zool. Anz., Bd. 182, Heft 1/2*: 143-144.

The species was described on the male only. Since its publication, new material has become available from Bihar and the Punjab and from the latter a female specimen was obtained, and is described here.

FEMALE: Size large, head dark brown, pronotum and abdomen generally rufous brown whereas the dorsum of abdomen is dark brown variegated with brownish spaces; head rather larger and wider than that of male; frontal rostrum about two and half times as wide as the first antennal segment; post clypeus yellowish white as in male from Panipat. Pronotum slightly widened at anterior margin; lateral lobes almost concolorous with the pronotum. Elytra oblique, as long as the mesonotum and separated from each other by a width which is more than the dorsal width of any one of them and with five longitudinal veins. Ovipositor rufous brown, as long as the length of body, moderately curved upwards and with acute apical valves; subgenital plate yellowish with distinct concave apex, thus giving it a bilobed appearance. Posterior femora stout, shiny rufous brown throughout; rest of the posterior legs yellowish; posterior metatarsi with five brownish denticles on each margin. *Measurements* (in mm): Female: Length of body 18.5; length of pronotum 4.5; width of pronotum 6; elytra 2.75; gap of elytra at base 2.5; posterior femora 13.25; posterior tibiae 9.5; ovipositor 19.5.

¹ *T. babaulti*, *T. maculithorax* & *T. fascifrons* described in the fauna by Chopard (1969) are not included in the key.

Material examined: 1 male from Hazaribagh (Bihar); 1 male and 1 female from Panipat, Karnal dist. (Punjab).

***Turanogryllus quadrilineatus* Bhowmik**
(vide 1969. *Zool. Anz.*, 182, 1/2: 144-145)

Additional material of this species is not available for study.

***Turanogryllus rufoniger* (Chopard) (Figs. 3, 4, 5 & 6)**

1925. *Gryllodes rufoniger* Chopard, *Ann. Soc. ent. France*, 94: 292.

1963. *Paragryllopsis rufoniger* Chopard, *Bull. Res. concil Israel*, 11B: 169.

*1967. *Turanogryllus rufoniger* Chopard, *Orth. Cat.*, 10.

Additional characters: MALE: Head deep brown with six distinct testaceous lines on occiput and vertex; clypeofrontal suture appears straight but effaced at the middle; a longitudinal suture extends from anterior ocellus to the extremity of anteclypeus. Pronotum almost parallel sided or slightly widened at posterior end but in the specimens from Dehra Dun the anterior end narrowed while the posterior end gradually widens; inferior margin of lateral lobes of pronotum straight, with angles almost rounded. Knees of posterior femora brown; posterior tibia with five to six internal and six external spines. Elytra testaceous brown and cover the abdomen; mirror oblique, rounded anteriorly, divided by a distinct curved vein, more than one and half times as wide as long, connected to first chord by one or two veinlets; oblique vein varies from three to four, in one example the last oblique being biforked; three chords of which first two strongly curved; apical field short, with four clear veins and with rectangular areolae; lateral field testaceous, with seven regularly spaced, moderately curved veins, mediastinal vein trimaculate. Subgenital plate bilobed at apex. Genitalia typical for the genus, the posterior emargination of epiphallus penetrating up to about half of the entire length and with a V-shaped projection in the middle; the dorsal lobe of ectoparameres with a lateral process which is digitiform (three to four digits) on its inner face, apical end of the ventral lobe with twelve denticles.

FEMALE: Completely tallies with Chopard's (1925) original description.

Immature stages: Immature stages of the species are readily recognizable but some minor variations are found in colour pattern, elytra and genital apparatus etc.

In two immature females (length of body 12mm, ovipositor 3mm) abdominal dorsum not entirely black but with two lateral and one median longitudinal blackish brown bands; elytra present as lateral pads only.

In four immature males (length of body 8 mm to 13 mm and width

about 1.5 mm long, overlapping elytral pads) and in one female (length of body 11 mm) the colour bands are on lateral margin of pronotal disc and not on anterior and posterior borders.

Measurements (in mm): Male: Length of body 13.5-14; length of pronotum 3-3.3; width of pronotum 5-5.5; elytra 8-9.5; posterior femora 10-11; posterior tibiae 7-7.25.

Female: Length of body 14.75-16.25; length of pronotum 5.25-5.8; elytra 3.25-3.75; posterior femora 10.75-11.5; ovipositor 12.9-13.6.

Material examined: 2 males, 2 females from Mysore city (University campus); 1 female from Gagret forest, Dist. Hoshiarpur (Punjab); 1 male from Hispana river, Dehra Dun.

Remarks: The species is readily identifiable by its particular colour pattern of head and of pronotum.

Turanogryllus jammuensis (Bhowmik) (Figs. 7, 8 & 9)

1967. *Gryllopsis jammuensis* Bhowmik, *Proc. Ind. Sci. Cong. Assoc. Benaras*, Part B: 491.

1969. (?) *Gryllopsis pakistana* Chopard, *Fauna Ind. Grylloidea*, 2:75.

Description: FEMALE: Size medium. Body moderately cylindrical, sparsely pubescent and testaceous varied with brown. Head rounded, dark brown, shiny and with six distinct yellow longitudinal lines, the lateral two of which are united at base and end near the eyes; front slightly flattened; frontal rostrum nearly twice as wide as the first antennal segment. Face yellow; clypeofrontal suture moderately arcuate. Eyes black, prominent and oval. Pronotum transverse, slightly narrowed both in front and behind, with both anterior and posterior margins straight; disc somewhat convex, varied with brown to blackish brown spaces, sparsely pubescent; lateral lobes yellowish except the extreme superior margins which are deep black, rounded at anterior angle, inferior margin slightly ascending posteriorly. Abdomen thinly hairy with a very prominent longitudinal median and two lateral blackish bands on the dorsum, ventrum yellowish. Ovipositor long and straight, inferior apical valves a little shorter than the superior ones. Legs testaceous. Anterior tibiae with a long oval tympanum at their external faces only. Posterior femora moderately stout, striated with brown at external faces, tibiae with six internal and seven external spines, the first external being very small. Elytra about 3 mm long and separated from each other by less than 1 mm distance, obliquely truncated; dorsal field shiny brown with four complete and slightly oblique veins, the venation is confused in the space between the fourth vein and the second discoidal; lateral lobes yellowish, with six regularly spaced veins, the mediastinal having a small branch at apex.

Measurements (in mm): Female: Length of body 12; length of pronotum 3; width of pronotum 4; elytra 3; posterior femora 10; posterior tibiae 7; ovipositor 11.

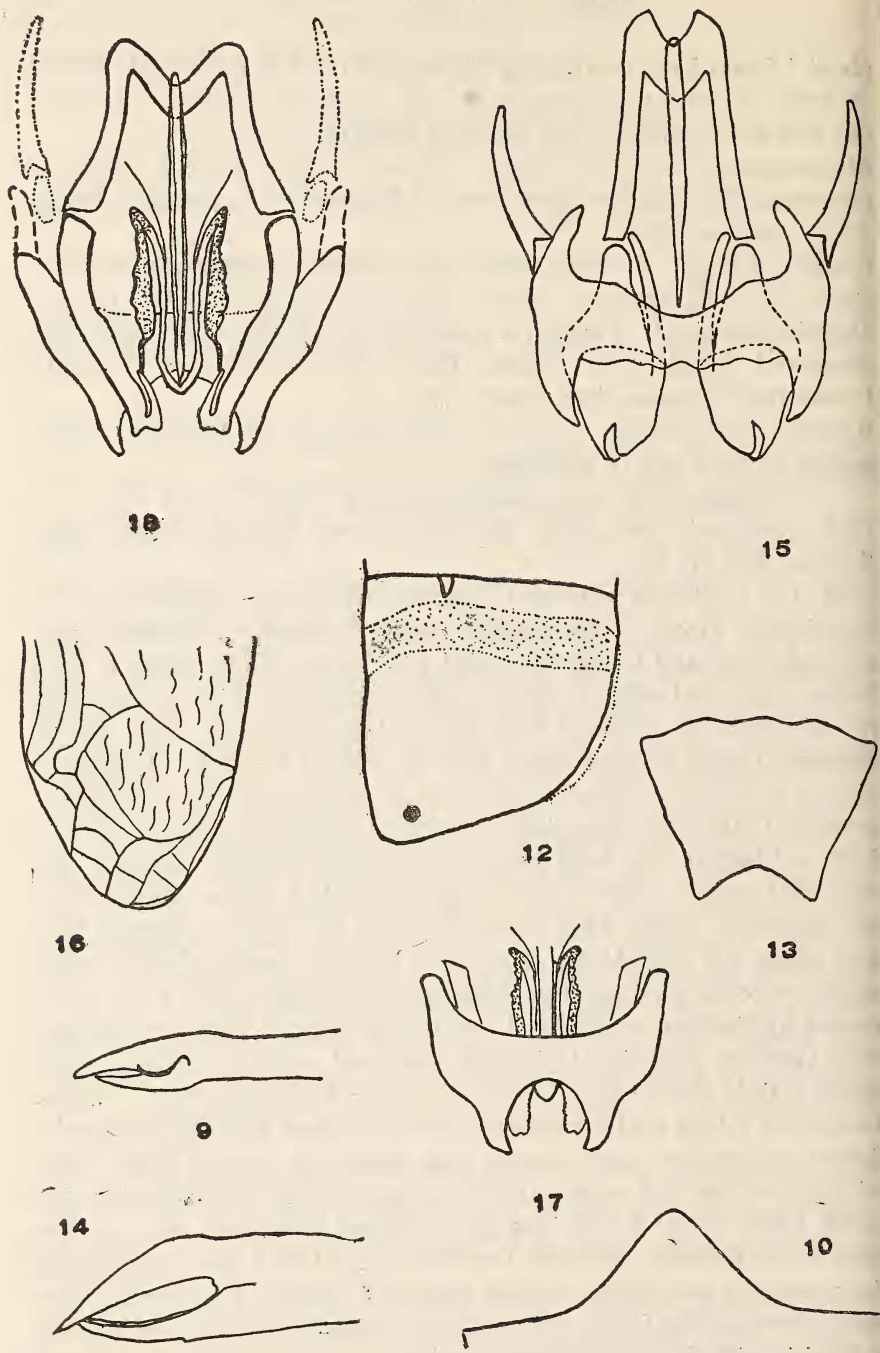


Fig. 9. *Turanogryllus jammuensis*, ovipositor. x 25; Fig. 10. *Turanogryllus virgulata*, male clypeofrontal suture. x 15; Fig. 12. *Turanogryllus histrio*, lateral pronotal lobe. x 22; Fig. 13. *ibid.*, subgenital plate. x 25; Fig. 14. *ibid.*, ovipositor. x 25; Fig. 15. *Coiblemmus compactus*, male genitalia, ventral view. x 20; Fig. 16. *Stephoblemmus humbertiellus*, male elytron, apical portion. x 10; Fig. 17. *ibid.*, male genitalia, dorsal view. x 20; Fig. 18. *ibid.*, male genitalia, ventral view. x 20.

Material examined: 1 female from Jhajjar (Jammu & Kashmir), coll. R. Tilak, dt. 5. 10. 1964.

Remarks: The species somewhat resembles *T. rufoniger* in its general aspect and coloration but can be easily separated by its longer elytra and their close approximation, sparse pubescence etc. Male yet unknown.

The description of the species shows that it is very close to the female of *G. pakistana* Ch. (1969) and the latter may turn to be a synonym. At present it has been provisionally included in the synonymy list.

***Turanogryllus virgulatus* (Bolivar) (Fig. 10)**

1900. *Grylloides virgulatus* Bolivar, *Ann. Soc. ent. France* 68:797.

1933. *Gryllopsis virgulatus* Chopard, *Rev. Suisse, Zool.*, 40:163.

1963. *Paragryllopsis virgulatus* Chopard, *Bull. Res. Council, Israel*, 11 B:169.

1964. *Turanogryllus virgulatus* Randell, *Canad. Ent.*, 96:1571; Chopard.

1967, *Orth. Cat.*, 10.

Additional characters: MALE: General coloration dark brown, shiny. Head strongly rounded, glossy, without ornamentation; frontal rostrum strongly convex, about twice as wide as the first antennal segment; facial parts testaceous rufous. Pronotum concolorous with head, anterior margin slightly concave, posterior margin straight, nearly parallel sided or very indistinctly narrowed at anterior end; disc convex with two pyriform brownish impressions at the middle; inferior margin of lateral lobes testaceous rufous while the superior margin concolorous with the pronotum and with the anterior angle nearly rounded and the posterior angle a little ascending. Dorsum of abdomen dark brown while the ventrum concolorous with facial parts, no incision on metasternal plate. Legs hairy, testaceous. Anterior tibia with an oval external tympanum. Posterior femora stout, posterior tibia with five internal and six external spines, the supero internal spurs equal in length to supero intermediate ones; posterior metatarsi with five to six brown denticles. Elytra cover the abdomen; two curved oblique veins; mirror more wide than long, postero-inferior angle broadly rounded, divided by a curved vein at the middle and united to the first chord by one veinlet; apical field very small and reduced to a few irregular areolae where two oblique veins and one false vein are recognizable.

FEMALE: Differs from male in being apterous and in having the colour of head, pronotum, abdominal dorsum much darker and size bigger; ovipositor remains open at rest, testaceous, straight, apex very acute. In one specimen from Mt. Stuart, Madras, the posterior tibiae with seven internal and six external spines; subgenital plate a little concave at apex but not bilobed as in other species of the genus.

Measurements (in mm): Male: Length of body 10.5-10.75; length of

pronotum 2.75-3; width of pronotum 3.5-3.8. Female: Length of body 12-16; length of pronotum 2.75-3.5; width of pronotum 4-4.25; ovipositor 8.5-10.

Material examined: 2 males, 1 female from Mysore city; 1 female from Nilgiri Hills (alt. 2628 m); 1 female from Mt. Stuart (Madras).

Remarks: The species is readily recognizable by its blackish appearance, somewhat depressed shape of female with its open type of ovipositor. It is only known from south India.

***Turanogryllus histrio* (Saussure) (Figs. 11, 12 13 & 14)**

1877. *Gryllodes histrio* Saussure, *M'em. Soc. phys. Hist. nat. Geneve*, 25:397.

1963. *Paragryllopsis histrio* Chopard, *Bull. Res. Council Israel*, 11B: 169.

*1967. *Turanogryllus histrio* Chopard, *Orth. Cat.*, 10.

Additional characters: MALE: Head spherical and convex; occiput and vertex with six yellowish light lines; frontal rostrum wider than first antennal segment. Clypeofrontal suture slightly arcuate. Fourth segment of maxillary palpi shorter than third, fifth largest, widened apically and obliquely truncated. Pronotum transverse; lateral lobes with rounded angles. Elytra a little shortened or as long as the abdomen; mirror almost transversely disposed, undivided; three oblique veins; apical field with somewhat irregular areolae. Anterior tibia with a long, oval internal and a very small rounded external tympanum; first external spine of posterior tibia denticle like. Supra anal plate with two spinule like projections. Subgenital plate more or less bilobed and projected much beyond the supra anal plate.

FEMALE: Differs from males in having reduced elytra which are widely separated, and with long, slender ovipositor with narrow and lanceolate apical valves.

Measurements (in mm): Male: Length of body 8-9.5; elytra 4.25; posterior femora 7-7.25.

Female: Length of body 11.5; posterior femora 8; ovipositor 7.

Material examined: 1 male from Kaziranga (Assam); 1 male, 1 female from Noorpur forest range, Dist. Gurdaspur (Punjab).

Remarks: The species is remarkable for its cylindrical, slender body with a brown band on the extreme superior margin of each pronotal lobe and two brown, prominent, spots near the postero median margin of pronotal disc.

Genus *Gryllodes* Saussure, 1874

***Gryllodes sigillatus* (Walker)**

1869. *Gryllus sigillatus* Walker, *Cat. Derm. Salt. Br. Mus.*, 1:46.

1877. *Gryllodes sigillatus* Saussure, *Me'm. Soc. phys. Hist. Nat. Geneva*,

25: 210; B. Bienko, 1933, *Bol. Soc. Esp. Hist. nat.*, 33:325; Randell, 1964, *Canad. Ent.*, 96:1588.

Additional characters: MALE: Pale yellowish to testaceous in colour. Body depressed. Head as wide as the pronotum anteriorly; front yellowish and sloping; frontal rostrum a little narrower than the first antennal segment with lateral sides characteristically dark brown. Pronotum transverse with silky pubescence, anterior margin slightly concave, posterior margin straight and with a characteristic irregular dark transverse band continuing on either side up to the lateral margin of the lateral lobes; disc flat, a little widened in the middle, with a longitudinal suture at the middle and with two pyriform colour impressions at the superior part. Elytra extend beyond half of abdomen (leaving last five tergites free); mirror obliquely disposed, antero-internal and postero-external angles somewhat rounded but the other two angles more or less angulated, divided by a curved vein at the middle and united to the first chord by one or two veinlets; diagonal straight, bifurcated at base and sometimes united with the first chord by a veinlet; anal field very sparsely reticulated; lateral field with four regularly spaced slightly curved veins; mediastinal vein with a short apical branch. Posterior femora rufous brown, stout, longer than posterior tibiae and with indistinct dark oblique striations on external faces; posterior tibiae with five spines on each margin.

FEMALE: Differs from male in having the elytra reduced to very small lateral pads. Ovipositor slender, subequal to posterior femora, with acute apical valves.

Immature stages: Females are apterous with reduced ovipositor while the males are with imperfectly developed elytra without clear neururation.

Measurements (in mm): Male: Length of body 12-14; length of pronotum 2.25-2.5; width of pronotum 3.75-4.25; elytra 4.75-5.5; posterior femora 9.5-11; posterior tibiae 7-7.5.

Female: Length of body 15.25-16; length of pronotum 2.5-3; width of pronotum 4.25-4.75; posterior femora 10.5-11.5; posterior tibiae 7.25-8; ovipositor 10.5-11.5.

Material examined: 1 male from Banisaugh (Jammu); 3 males, 21 females from Ambala (Punjab); 1 female from Dhaukhand Forest Range, Dist. Saharanpur; 3 males, 3 females from Dehra Dun; 2 males from Sahastna Dhara Hills, Dehra Dun; 1 female from Timli Forest Range, Dehra Dun; 1 female from Rajpur (Madhya Pradesh); 1 male from Santal Parganas (Bihar); 1 male from Subhasgram (W. Bengal); 5 males, 9 females from Calcutta; 1 male from Nagarjunsagar (Andhra Pradesh); 2 males, 1 female from adjoining area of Mysore city; 1 male from Couriaghat (south Andaman Island); 1 male from Mallaca village (Car Nicobar).

Remarks: The species is readily recognizable by its general appearance

and colour pattern and is commonly seen in undisturbed places in houses.

Genus *Itaropsis* Chopard, 1925

***Itaropsis tenellus* (Walker)**

1869. *Gryllus tenellus* Walker, *Cat. Derm. Salt. Br. Mus.*, 1:37.

Additional characters: FEMALE: Head shiny dark brown, with or without four indistinct brownish light lines on posterior head. Clypeofrontal suture almost straight. Pronotum almost parallel sided, both anterior and posterior margins straight; disc with two rufous brown pyriform impressions and with a median longitudinal suture. Elytra cover the abdomen in one specimen, in another, they are slightly shorter; dorsal field with four to five obliques, somewhat regularly spaced veins and one to two branches from the discoidal.

Measurements (in mm): Female: Length of body 11.5-12; elytra 8-9; posterior femur 8.5-9; posterior tibia 4.5-5.

Material examined: 1 female from Dehra Dun, coll. S. Lal, dt. 9-5-1961; 1 female from Mussoorie (Uttar Pradesh), coll. R. P. Mukherjee, dt. 5-12-1961.

Remarks: Female of this species is unique among the Gryllidae for its rudimentary ovipositor which is represented by a styliform process almost enclosed by the subgenital plate.

Genus *Coiblemmus* Chopard, 1936

***Coiblemmus compactus* (Chopard) (Fig. 15)**

1928. *Homaloblemmus compactus* Chopard, *Spol. Zeyl.*, 14:201.

Additional characters: MALE: Head slightly wider than pronotum. Frontal rostrum almost twice as broad as the first antennal segment. Lateral field of elytra yellowish and with four somewhat parallel and equidistant veins; the mediastinal vein with a branch originating either from its very base or at most from its basal half and also with a small apical branch. Male genitalia: Epiphallus roughly H-shaped when viewed dorsally, the anterior margin moderately emarginate, the emargination is maximum at the middle; the posterior margin roughly U shaped and also emarginate, posterior lobes become evenly pointed and are curved inwards. Ectoparamere, when viewed ventrally, appears as a stout and simplified structure, its posterior margin having the corners produced, pointed and curved dorsally, basal half of ectoparamere divided into two processi of unequal width, the anterior internal process being thinner and rod like, a little curved outwards and comparatively longer than the external one. The courses of mesal lobes cannot be completely seen. Endoparameres, on profile somewhat C shaped, basal union of two endoparameres greatly expanded and with inwardly angulated lateral

processi. Virga unspecialized, moderately long and quite narrow.

Measurements (in mm): Male: Length of body 14-14.8; length of pronotum 3.2-3.5; elytra 7.8-8.25; posterior femora 10.25-10.6; posterior tibiae 6.9-7.25.

Material examined: 2 males from Mysore city (University campus), coll. S. Vasantha, dt. 1964.

Remarks: This monotypic genus is widely distributed in Ceylon and less commonly in Tamil Nadu. The male genitalia has been described elaborately for the first time.

Genus *Stephoblemmus* Saussure, 1877

***Stephoblemmus humbertiellus* Saussure (Figs. 16, 17 & 18)**

1877. *Stephoblemmus humbertiellus* Saussure, *Mem. Soc. Phys. Hist. nat. Geneve*, 25:428.

Additional characters: The specimen at hand tally in majority of characters with the description and diagrams given by Saussure (1877) but some minor variations are also found viz., the mediastinal vein in left elytron with two branches at apex and in the right one with one branch; lateral field with three prominent but irregular and slightly curved veins, the middle one biforked apically in left lateral field; apical field comprised of a few irregular but distinct areolae; anterior tibiae with a small internal and a moderately long, oval external tympanum in each; posterior tibiae with five internal and six external spines in each.

Male genitalia: The genitalia in general resembles that of genus *Miogyllus* Saussure and thus it should be placed in the subtribe *Sciobiina* Bolivar (Vide Randell 1964, *Canad. Ent.*, 96:1589).

Epiphallus: Distinctly H shaped in dorsal view, emargination of anterior border rather very broad and relatively deep, reaching up to one third the length of epiphallus; emargination of posterior border noticeably narrower but reaching still deeper; the bridge formed by the two emarginations is about one third the entire length; anterior internal apodemes moderately long. Ectoparameres almost rod like, slightly incurved structures with spine like projections at apices and each is bent on itself. Mesal lobes remarkably prominent in the form of a double ribbon, the external process very thin, irregular but comparatively broader and connected with the spine like projection of the ectoparamere by a thread like connection which can be seen only on profile, the internal process descends downwards as a narrow process, one on each side of the virga and ultimately united with each other forming a V shaped projection just on the medio-posterior emargination of epiphallus and is visible both dorsally and ventrally. Endoparameres J shaped on profile and with the antero-ventral edge weakly expanded. Virga long, narrow, and unspecialized; basal portion connected by the expanded bases of the endoparameres; the apical portion being visible dorsally

in between the apices of the mesal lobes. Rami simple, rod shaped, a little expanded and shallowly divided at their dorsal extremities. Ramal plates cannot be traced.

Measurements (in mm): Male: Length of body 10; elytra 5.25; wings 14; posterior femora 7.25; posterior tibiae 5.25; width of frontal lamellar process 5.2.

Material examined: 1 male from Rajaji Sanctuary, Dist. Saharanpur (Uttar Pradesh), Coll. T. D. Soota, Dt. 13-7-1963.

Remarks: This species of the monotypical genus is reported for the first time from India. The species is rare since the specimen dealt with here is the third one known so far.

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REFERENCES

- BEY-BIENKO, G. Y. (1933): Records and descriptions of some Orthoptera from U.S.S.R. *Bol. Soc. esp. Hist. nat.* 33:317-341.
- BHOWMIK, H. K. (1967): Six new genus of Gryllidae from India. *Proc. 55th Ind. Sc. Cong. Part 3*:491-492.
- (1969): Studies on Indian Crickets (Orth.: Insecta), Part I. *Zool. Anz. Bd. 182, Hefl. 1/2*:143-152.
- BOLIVAR, I. (1900): Les Orthoptères de St. Joseph's College à Trichinopoly (Sud de l'Inde) 2 me partie. *Ann. Soc. ent. France* 68:761-812.
- CHOPARD, L. (1925): Descriptions de Gryllides nouveaux (Orthoptères). *Ann. Soc. ent. France* 94:291-332.
- (1928): Revision of the Indian Gryllidae. *Rec. Ind. Mus.* 30:1-36.
- (1928): Additional notes on the Gryllidae of Ceylon. *Spol. Zeyl.*, 14:197-208.
- (1933): Gryllidae de l'Inde méridionale. *Rev. Suiss. Zool.* 40(5):161-167.
- (1963): Notes sur la faune des Orthoptéroïdes d'Israël et de quelques régions limitrophes (Blattodea, Gryllacridoidea, Gryllodea). *Bull. Res. Council of Israel* 11B:161-176.
- *————— (1967-68): Orthopteroides Catalogus, 10 & 12.
- (1969): The fauna of India and the adjacent countries, Grylloidea, Calcutta. 2:421, (1964).
- RANDELL, R. L. (1964): The male genitalia in Gryllinae (Orth. Gryllidae) and a tribal revision. *Canad. Ent.* 96: 1565-1607.
- SAUSSURE, H. DE (1877-78): Melanges Orthopterologiques, Vme. Fascicule, III Gryllides (I & II partie). *Me'm. Soc. phys. Hist. nat. Gene've*, 25:169-504, 509-836.
- *TARBINSKII, S. P. (1940): Pryigayushchiye pryamokriliye nasyekomiye. Azerbaidjandkoi S.S.R. (Moscow and Leningrad).
- WALKER, F. (1969): Catalogue of the specimens of Dermaptera Saltatoria in the collection of the British Museum, London 1:225-423.
- *Denotes references not seen in original.